

## **I. Personal Defense Weapon: Only for Defense?**

There has been some debate on the criteria, need and tactical role of the PDW. Let us examine this issue. It can be compared to the submachine gun. The SMG provided firepower in a smaller package as a companion arm to the World War II and post-war battle rifles. However, with the miniaturization leading to the assault rifle, the role of the SMG has supposedly declined.

Yet the SMG shoots on! Its major disadvantage is lack of range, because of only firing pistol ammunition. This seeming disadvantage has many benefits which are low: recoil, muzzle blast, climb, penetration, size, weight, cost and training time (Taylor, Analysis 14). The Europeans, Israelis, and Chinese have been more appreciative of the SMG and machine pistol than the Americans.

The SMG will be more versatile than the handgun and the shotgun in most tactical situations (Taylor, Sub 8). No one questions its OFFENSIVE capabilities. Its use has been expanded from the military to police, SWAT and others.

### **Handicaps of the SMG**

But its size, weight and limited range handicaps its use, especially with the arrive of the assault rifle and mini-assault rifle, such as: Colt XM177, HK53, AKSU, etc.

## **II. Machine Pistol to the Rescue?**

Even smaller than the SMG are the machine pistols. They have the compact size and low weight desired for the PDW. But most have the following problems: not controllable on full automatic fire, short ranged and awkward with stock and/or attached holster (Karwan 60-1). The

standard pistol design fares very poorly for full automatic fire. Only the very expert can use them effectively in specialized circumstances (Thompson, Mastering 66-7). The PDW must learn from the deficiencies of the machine pistol.

### **III. Back to the Future**

The Astra Model F. Hill SMG, Polish PM63, Colt SCAMP, Ingram, Davis arm gun and Sarvis forearm gun all have characteristics that would lead to a good PDW. That is to say, compact firepower.

### **IV. Changing Requirements and Present Criteria for PDW**

In 1980 the American Rifleman reported that the Joint Service Small Arms Program wanted to replace the 1911A1.45 pistol with a 9mm and improve hit probability (Cowgill 82). Even today the Close Combat Armament Center brochure of TACOM-ARDEC, Picatinny Arsenal, lists the M9 as a PDW.

The requirements changed in 1993 from a simple handgun to:

Weight: <1.5 lbs.	100 meter range
Defeat body armor at 50 meters	
Hand-free carry and to be worn on person 24 hours a day	
Use by special operations troops (Crist 102, 106).	

According to the Army Small Arms Master Plan of 1995, it was reported that the PDW should be:

<3 lbs.	500-625 ft. range
Concealable	Recoil of 9mm
Low magnetic signature	Reliable in all weather (Grimes 34-5)

A later report in 1997 indicates:

Replace pistols/SMGs	Selective fire
200 meter range	Soft/hard target capability
Leap ahead technology	
Users: those not armed with rifles, special operations, and law enforcement (Steadman, <u>Fighting</u> 21-2).	

Nick Steadman reported that the NATO European Staff target for the PDW as of October 1999 was:

Weight: Handheld – 1 kg (700 gm. desired)	Shoulder - 3 kg
Range: 100-200 meters	Protected targets: 30-50 meters desired

Suitable while wearing armor, NBC suits and winter clothing (SADW).

According to Mark McFadden of the Picatinny Arsenal, the U.K. has combined with NATO to develop a PDW replacing the 9mm. However, the U.S. does not intend to replace its 9 mm systems (E-mail).

U.K. Summary of Requirements:

<.5 meters long	Weight: loaded – 3 kg.
Defeat CRISAT protected targets: 150 meters	
Off the shelf designs in calibers not used by UK armed forces and in 5.56 will be assessed (no 9mm?)	
First batch in service 2003; follow up deliveries: 2004 and 2005 (MoD) (Wood).	

In summary, the PDW requirements evolved from a replacement for the .45 pistol to an entirely new ambitious and even radical firearms category.

## V. Design Problems

To keep a PDW compact, magazine capacity of 25 rds., range requirements and body armor penetration are difficult to achieve.

Ammunition Selection is critical. To achieve high magazine capacity, reducing the base size of the cartridge allows more rounds to be stored in the magazine. Reducing the bullet size and weight also helps with this problem, i.e., HK 4.6mm, FN 5.7mm.

Storing the magazine in the pistol handle does not allow enough round capacity (25 rds.). Enlarging the pistol handle will make the firearm difficult to use for those with less than large hands and with winter gloves. Necking down standard pistol rounds allows the use of a standard pistol design, i.e. .224Boz, .224 VOB. Note, as discussed previously in machine pistols, this layout does not allow good control on full auto-fire.

Most of these attempts mean using cartridges of small size and thus stopping power. In the Korean War, the 7.62 Tokarev and .30 carbine gained the reputation of having poor stopping power (Russ 143, 151, 212).

Increasing the base or overall size of the cartridge will increase the length and size of the magazine, thus hurting the compactness of the PDW, i.e., 224Boz, 5.56mm NATO.

Body Armor Penetration of CRISAT protected targets at 150 meters is a formidable task for the PDW. CRISAT body armor consists of 1. mm titanium with twenty layers of aramid (John, James 45). If this is an all-important demand, then the 9mm will not do. Then others will ask, why not go to the 5.56 NATO cartridge.

Other possible candidates are: . 221 Fireball, 5.7 Johnson, .30 carbine, 9mm Win. Magnum, 9.2mm Russian. High technology ammunition, such as the Steyr plastic cased flechette could be utilized. Any new ammunition means increased cost and logistics.

Use of the standard magazine increases the size of the firearm. The Czechoslovak and Uzi designs are the most space efficient. The new HK 4.6 mm PDW follows this layout. Still, in most designs the magazine protrudes, hurting the compactness of the firearm.

Ammunition and Size will Determine the Design of the PDW.

**VI Can the 9mm x 19 Fly?**

Would the 9mm NATO make an effective PDW cartridge? Does it have the effective range?

Theoretical Range:

Line of sight danger zone	350 meters	(45 x 160 cm target)
Terminal Ballistics	630	(15 kg, 108 ft lbs)
Relative penetration (ball)	300	(steel helmet) (Kjellgren 40-3)
Majority SMGs	100 – 200	
Selective fire/long barrel	250-350 yds.	(Nelson/Musgrave 6)
SMGs	150 meters	(Dmitrieff 9)
SMGs – aimed/suppressive fire	200	(Ferguson 77)

Demonstrated Range:

.22RF handgun/no wind	500 yds.	(full silhouette)
.38 target handguns	300	(turkey silhouette) (Keith 109, 116)
SIG P210 pistol	100-200	(Thompson 71)
MP5 Semi-Auto	150	(Ayooob 7)
SMGs	100-150 meters	(Taylor, <u>Sensible</u> 23)
Marshal Arms Pistol	150 yds.	(Balsavage)

It becomes apparent that the 9mm x 19 has more range potential than most are aware of. Remember Elmer Keith using a .44 magnum hitting a deer at 500-600 yards (Seyfried 26).

Heavier Loading/Longer Barrel would improve the 9mm as Dmitrieff suggests, which would put it into the carbine class (3). This is what the Czechoslovaks did with the Models 24 and 26 in 7.62 Tok (Nelson and Lockhoven 189). 9mm 5mg ammunition exists and +P, +P+ ammo are used on a regular basis by law enforcement. Further comparisons are:

Thompson – Center pistol	9 in. barrel	CCI Blazer	124 gr – 1350 Fps
Revolver	4 in barrel	Rem. 357	125 – 1450
			(Comus, 222, 4)
Walther P38	4-7/8 in	Win.	115 – 1155
Marshal Arms Pistol	6.5 in	Win.	115 – 1212
			(Balsavage)

With a longer barrel, an increase of 15% velocity can be gained (McLaughlin 67).

Better Sights equal to current assault rifles and/or high technology. Tritium red dot type of sights would improve hit capability and range.

Body Armor can be overcome by using armor piercing ammunition at reasonable ranges, although civilian police would not appreciate this.

Common ammo as used by the pistol is an advantage on the battlefield (McLaughlin). Any new, non-standard ammunition increases logistical supply problems. Note: the U.S. does not intend to change from the 9mm system (McFadden). High tech ammunition not only increases logistics,

but also the time/cost for research and development. Will any non-standard ammunition provide a significant tactical advantage over the 9mm?

The 9mm x 19's advantage is that it is the world's most used military pistol/SMG cartridge! Will the 9mm make an effective PDW? Only time, range and armor piercing questions will tell.

## VII Proposed Criteria for PDW

Height:	6 in/15.4cm	Barrel:	7 in+/17.8 cm+
Length:	<12 in/30cm	Weight:	3 lbs/1.36 kg
Capacity:	25+ rds.	Cyclic Rate:	semi, burst, 600 rpm
Sights:	Rifle, tritium dot	Range:	150 meters
Stocks:	Retractable, Detachable	Ammo:	9mm, 221 fireball, Steyr Flechette, ?

### Features:

Ambidextrous controls	Optional higher capacity magazine
Flash suppressor/muzzle brake	Suppressor
Picatinny rail for: sights and accessories	Modular design Tactical sling

### Most important criteria:

Ammo selection must meet range, armor piercing and stopping power requirements. Is the 9mm x 19 good enough? Will adopting non-standard or high tech ammo be enough of a tactical advantage over the logistical disadvantage?

Sights: use assault rifle type of sight or the new tritium dot sights: Trijicon, Ring Sight, Meprolight. These new types of sights will increase speed of day/night target acquisition and range without needing batteries.

Stocks must be retractable, i.e., M3, H&K, etc. Also, detachable, folding, sturdy and aid shooting.

The horizontal magazine makes the firearm more compact as contrasted to standard magazines, which protrude from the firearm.

With the magazine placed horizontally above and parallel to the barrel, it allows: compactness, high magazine capacity, able to fire from the low-prone position, holsterable (Marshal Arms). Low barrel position with the pistol handle forward makes repeat shots easier and to be fired one-handed. The Hill SMG set the example for the HKG11, FNP90 and Marshal Arms Assault Pistol.

Holsterable to be available to the user at all times.

Compact firepower, keep the PDW small. Do not make it into a larger SMG or assault rifle.

**VII (B) Slide comparing Uzi SMG to horizontal magazine firearm**

**VII (C) Slide comparing HKMP5 to Marshal Arms Assault Pistol**

## **VIII Cautionary Note**

PDW will be a highly desirable weapon for terrorists and criminals. It offers concealed firepower, more range and magazine capacity than the



pistol and shotgun. More attention will be needed to secure these firearms.

Yes, there are already other compact firearms out there. Also, we all know that criminals follow all gun control legislation.

## **IX      Need for and Tactical Role of the PDW**

The PDW is not an assault rifle! For troops that need shorter rifles, arm them with mini-assault rifles.

The pistol is regarded as a defensive weapon (Taylor, Analysis 75), with a maximum effective range out to 25 meters for most personnel. Col. Cooper states it takes a minimum of 500 rds. to train on (101). Also, the instructors must be highly qualified. Its magazine capacity and range are limited.

In 1963, Nelson's The World's SMG, stated, "Previous firearms for self-defense, such as pistols, are no longer sufficient for the crews of heavy weapons, or for the members of small specialized infantry or patrol units." (20).

Dmitrieff echoed the above by saying, "The need for a light and compact arm, more accurate than a pistol, has been felt by soldiers since the introduction of firearms." (5).

Both have encouraged the development and use of the SMG. Chuck Taylor has pointed out that the stocked machine pistol and the SMG are more effective than the pistol (Machine 50). Even though the assault rifle has replaced the SMG in a larger role, both are too large for PDW applications.

Tactical Mission Need: Personal Defense Weapon to provide more firepower and range than a pistol, yet is smaller than the standard SMG,

carbine, and assault rifle. Required for crew-served weapons personnel, wheel/armor/aircraft crews, combat leaders, special operations, police, SWAT, etc. Holsterable/concealable. One-handed firing while: driving, boarding ships, climbing, rappelling, wounded, etc. or those normally issued with a pistol.

The PDW is controllable on full-automatic, has more range, magazine capacity and is easier to train on than the pistol. Without a stock, it is basically a defensive compact weapon. (Note: some slings aid in firing). When a tanker has to sweep his vehicle or unhorse it – he will have a far more capable PDW than a pistol!

### Can the PDW Be Offensive?

Yes, with a well-designed stock that aids shooting. Detachable, retractable, aid in compactness.

Good sights equal to rifle or high tech tritium ret dot sights help in target acquisition and range. Both stocks and sights give the PDW full use of its potential.

Combined with other features previously mentioned, all combine to give the PDW a hit capability to 150 meters and equal to most SMG in combat effectiveness. The PDW could be compared to a miniaturized SMG but with longer range and accuracy potential.

Its niche is compact firepower. With the recent emphasis on Military Operations in Urban Terrain and Close Quarters Battle, the need for it is even stronger.

Let us change the Personal Defense Weapon's name to the **"Assault Pistol"** to emphasize its size and offensive potential.

## **X Errors and Recommended Reading**

All errors, opinions and conclusions are solely the author's. The hope of this presentation is to further debate, and in so doing, benefit the soldier and police officer.

### Recommended Reading

#### **Historical:**

World's Submachine Guns, Vol. I, by Nelson, Lockhoven.

World's Machine Pistols and Submachine Guns, Vol IIA, by Nelson, Musgrave.

#### **Shooting Impression:**

Karward, Charles

Thompson, Leroy

both in leading firearms magazines.

#### **Up-to-Date Info:**

Small Arms Review: [Smallarmsreview@aol.com](mailto:Smallarmsreview@aol.com)

Steadman, Nick: Small Arms Data by Wire (SADW)

SADW @compuserve.com and leading firearms magazines.

#### **Tactical Use of:**

Books and articles by Taylor, Chuck:

The Combat Shotgun and Submachine Gun: A Special Weapons Analysis

SWAT magazine

Tactical Shooter

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Modular design  
Tactical sling

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